

National Aeronautics and Space Administration



Human Landing System NextSTEP-2 Appendix N **BAA Release**

Industry Forum

July 7, 2021

HLS Program



Agenda



Time (CT)	Topic	Speaker
12:00 pm	Welcome and Introductions	JOE VERMETTE HLS Strategic Communication Lead, NASA/MSFC
12:05 pm	HLS Acquisition Planning – Services Acquisition Structure, App N Overview	DR.LISA WATSON-MORGAN Program Manager, Human Landing System, NASA/MSFC
12:20 pm	CLIN Structure Discussion	DR. JEREMY KENNY HLS Mission Systems Technical Manger, NASA/MSFC
12:45 pm	Closing remarks	JOE VERMETTE



- **We will not be taking questions during today's forum**
- **Comments and questions shall be submitted electronically to HQ-NextSTEP-BAA@mail.nasa.gov, Attn: Jennifer McCaghren, no later than 5:00 p.m. Central Time on July 9, 2021.**
- **NASA will not provide evaluations, opinions, or recommendations regarding any suggested approaches or concepts**
- **NASA remarks and explanations during today's forum do not qualify the terms of any future solicitations (i.e., the solicitation governs)**

Artemis: Landing Humans On the Moon



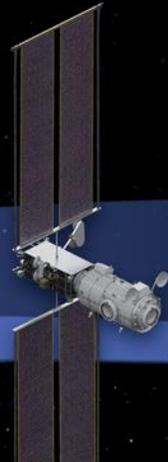
Lunar Reconnaissance Orbiter: Continued surface and landing site investigation



Artemis I: First human spacecraft to the Moon in the 21st century



Artemis II: First humans to orbit the Moon and rendezvous in deep space in the 21st Century



Gateway begins science operations with launch of Power and Propulsion Element and Habitation and Logistics Outpost



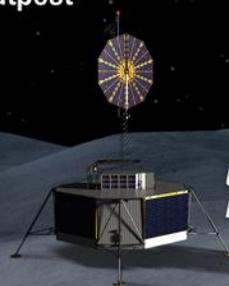
Artemis III-V: Deep space crew missions; cislunar buildup and initial crew demonstration landing with Human Landing System



Early South Pole Robotic Landings
Science and technology payloads delivered by Commercial Lunar Payload Services providers



Volatiles Investigating Polar Exploration Rover
First mobility-enhanced lunar volatiles survey



Uncrewed HLS Demonstration



Humans on the Moon - 21st Century
First crew expedition to the lunar surface



LUNAR SOUTH POLE TARGET SITE

Artemis Base Camp Buildup

First lunar surface expedition through Gateway; external robotic system added to Gateway; Lunar Terrain Vehicle delivered to the surface

Sustainable operations with crew landing services; Gateway enhancements with refueling capability, additional communications, and viewing capabilities

Pressurized rover delivered for greater exploration range on the surface; Gateway enables longer missions

Surface habitat delivered, allowing up to four crew on the surface for longer periods of time leveraging extracted resources. Mars mission simulations continue with orbital and surface assets.

Lunar Terrain Vehicle (LTV)

Crew Landing Services

Pressurized Rover

Fission Surface Power

ISRU Pilot Plant

Surface Habitat

SUSTAINABLE LUNAR ORBIT STAGING CAPABILITY AND SURFACE EXPLORATION

MULTIPLE SCIENCE AND CARGO PAYLOADS | U.S. GOVERNMENT, INDUSTRY, AND INTERNATIONAL PARTNERSHIP OPPORTUNITIES | TECHNOLOGY AND OPERATIONS DEMONSTRATIONS FOR MARS

Design Reference Missions



HLS Sustained Phase Design Reference Missions					
Property	HLS-DRM-001 Polar Surface Sortie	HLS-DRM-002 Extended Surface Stay	HLS-DRM-003 Non-Polar Surface Sortie	HLS-DRM-004 Zero-G Adapted Crew	HLS-DRM-ODS Orion Direct Sortie
Summary	Brief Gateway based surface mission to perform science and prepare for Base Camp missions. Crew resides in lander	Month long Base Camp missions to prepare for Mars missions. Crew resides in surface assets	Brief surface mission to region/site away from the South Pole for scientific objectives	Month long Base Camp missions to study impacts of weightlessness on surface crew. Crew resides in surface assets	Contingency surface mission to perform science and prepare for Base Camp missions. Crew resides in lander
Crew Size	2	4	2	4	2
Crew Time in NRHO prior to Descent	4.5 Days (TBD)	4.5 Days (TBD)	4.5 Days (TBD)	105 Days (TBD)	4.5 Days (TBD)
Surface Stay Duration	5.7-6 days	31.8 Days (TBD)	2.3-6 days (TBD)	31.8 Days (TBD)	5.7-6 days
HLS Surface Habitation Duration	5.7-6 Days	5 Days (TBD)	2.3-6 Days (TBD)	6 Days (TBD)	5.7-6 Days
Crew Staging Vehicle	Gateway	Gateway	Gateway	Gateway	Orion
Available Surface Assets/Infrastructure	None required	Yes (Habitable surface assets)	None required	Yes (Habitable surface assets)	None required
Landing Site	South Pole	South Pole	Global	South Pole	South Pole
Darkness	No	Yes	No	Yes	No
# of EVAs	4	Transfer to/from surface asset(s)	1-4 (TBD – dependent on site and mission date)	Transfer to/from surface asset(s)	4

DRAFT/NOTIONAL/SUBJECT TO UPDATING AND REVISION BY NASA AT A LATER DATE



Provide an overview of NASA's HLS NextSTEP-2 Appendix N BAA released on July 01, 2021

- **Appendix N BAA Objective:**

- *Engage with potential commercial partners, prior to future HLS Lunar Exploration Transportation Services (LETS) contract solicitation, for Sustaining HLS concept studies, concept of operations (ground and flight) development, and risk reduction activities*

- **Appendix N Procurement Timeline**

- Request for Information (RFI) on May 3, 2021, industry comments received May 6, 2021
 - Industry comments factored into final Appendix N RFP content
- Request for Proposals (RFP) released on July 1, 2021
- Proposals due by August 2, 2021
- HLS intends to award in September 2021

Summary of Appendix N BAA Documents with RFP Release (7/1/2021)



- Appendix N BAA Main Body
- NextSTEP-2 Omnibus BAA Amendment 16

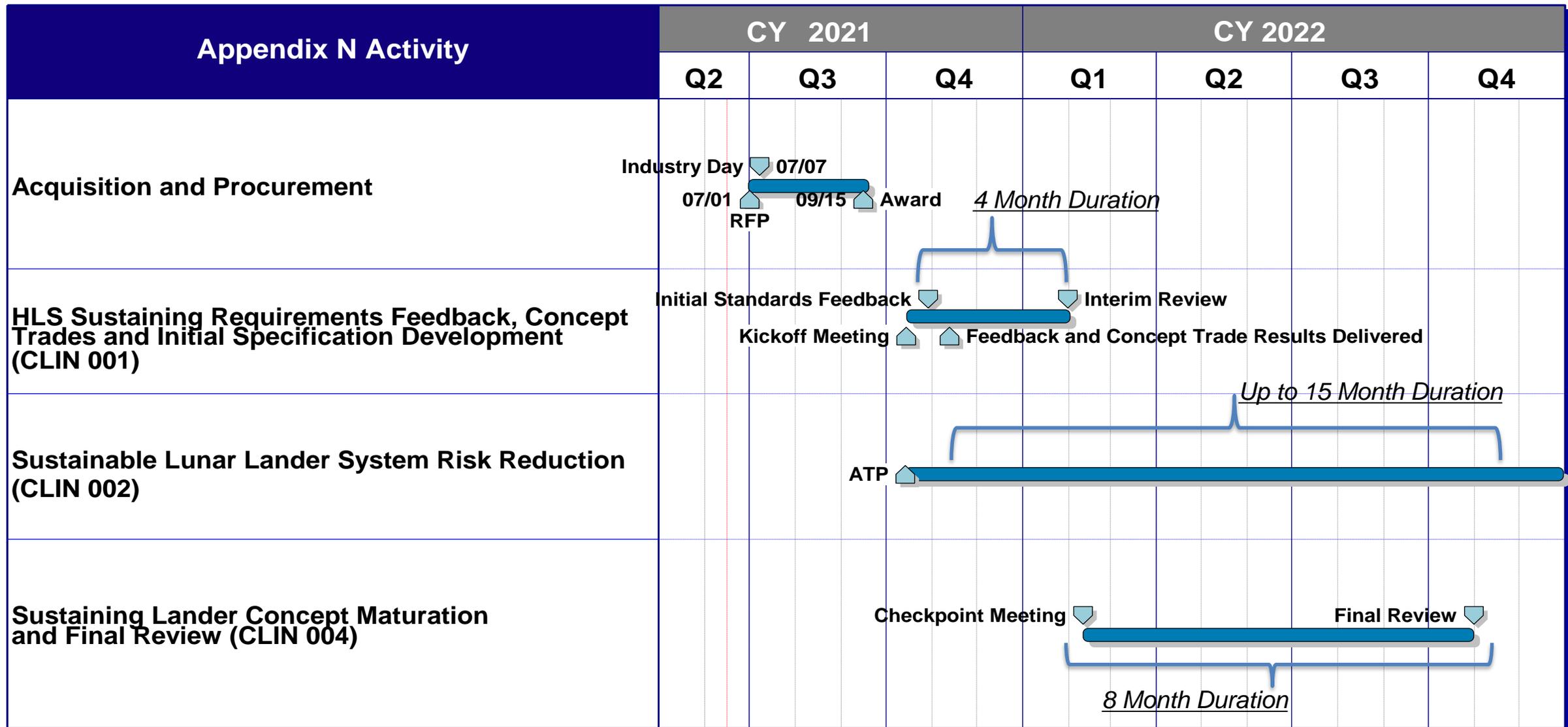
Attachments

- Attachment A – HLS Concept of Operations, Reference material for Proposal Deliverable
- Attachment B – HLS Requirements, Referenced Standards, Interface Documents, Supporting Documents
- Attachment C – CLIN 001 Trade Study Definitions and Supporting Materials
- Attachment D – General HLS Reference Information
- Attachment E – General Artemis Cross-Program Reference Information
- Attachment F – Model Contract, Corporate Contribution Worksheet, Pricing Template, Summary Quad Chart Template
- Attachment G – NASA Center Capabilities and POCs, Government Resource Request template, reference GFP and GTA forms
- Additional Attachments – Controlled NASA Documentation
 - *Multiple solicitation attachments are classified as controlled documents (e.g., export controlled, NASA Sensitive, etc.). Access to this controlled information that is part of this solicitation can be obtained by submitting a written request to the Contracting Officer, Jennifer McCaghren, at jennifer.b.mccaghren@nasa.gov. Access to these materials will be granted solely for the purpose of preparing a proposal under this solicitation.*

*The provided **DRAFT** NASA Sustaining requirements, Standards, and supporting documentation are still in development by NASA.*

Areas of development include final requirements language, design reference mission details, projected flight manifest, Cross-Program interfaces and sustaining mission health & medical requirements.

Appendix N Contract Timeline (CLIN 001, 002, and 004)





Appendix N CLIN Structure

- **CLIN 001: Sustainable HLS initial concept development, concept trade studies, and Initial Specification development**
 - Period of Performance is ATP + 4 months
 - All proposals must include CLIN 001 to be considered eligible for evaluation. Any proposals without CLIN 001 content provided will be ineligible for evaluation and award.
- **CLIN 002: Risk reduction efforts**
 - Period of Performance is ATP + 15 months, with individual task durations allowed to vary
 - Each risk reduction task will be individually designated in the submitted proposal.
 - Government will decide which risk reduction task(s) will receive immediate funding based on programmatic priorities and funding availability.
 - Risk reduction tasks that do not receive immediate funding will be incorporated as contract options that the Government may decide to fund later.
- **CLIN 003: Indefinite Delivery Indefinite Quantity (IDIQ) – Special Studies Task Orders (ATP + 36 months)**
- **CLIN 004: Sustainable HLS Final Specification development and Verification & Validation approaches**
 - Period of Performance is 8 months after completion of CLIN 001 IF Government exercises option
 - All proposals must include CLIN 004 to be considered eligible for evaluation. Any proposals without CLIN 004 content provided will be ineligible for evaluation and award.
 - *CLIN 004 proposal content will be evaluated and incorporated as a contract option for future funding*



Appendix N BAA – CLIN 001 Overview

CLIN 001 – HLS Sustaining Requirements Feedback, Concept Trades, and Initial Specification Development (4-month duration)

- **Industry feedback solicited on DRAFT set of NASA Sustaining requirements, standards, and supporting documentation**
 - Industry feedback is solicited on this set of DRAFT documents to support NASA finalization of this material
 - Final feedback due by ATP + 6 weeks
- **Industry support solicited on Sustaining HLS mission approaches through Trade Studies**
 - 9 required studies listed in RFP – Trade definitions and reference documents in Attachment C
 - Results due by ATP + 6 weeks
- **HLS Integrated Lander System Initial Specification Development**
 - HLS Integrated Lander System Initial Specification (for Sustaining Missions) created based on DRAFT NASA documents delivered and Company's approach
 - Delivered by ATP + 4 months

Government engagement with CLIN 001 activities will be limited to joint working group support; no subject matter expertise, facility usage, or any other type of Government engagement will be allowed.



Appendix N BAA – CLIN 001 Overview (Cont.)

CLIN 001 – HLS Sustaining Requirements Feedback, Concept Trades, and Initial Specification Development (4-month duration)

• Sustaining Lander System Interim Review

- Hosted by company at no later than ATP + 4 months
- Covers at least the following content:
 - Offeror’s Sustaining Lander System Initial Specification and Standards
 - Mission concept of operations for each DRAFT Sustaining Design Reference Mission (DRM)
 - Summary of all trade study results including impacts on the Offeror’s Sustaining Lander System design(s).
 - System Concept Risks, updated as applicable from the proposal version
 - Offeror’s Sustainable HLS Architecture Concept, updated as applicable from proposal version

• Final CLIN 001 Products Delivered at Interim Review

Deliverable	Deliverable Format	Document Content
Lander System Initial Specification	Status Presentation and Initial Document	Attachment A2 (Suggested)
Concept of Operations, including Manufacturing and Operations	Status Presentation and Initial Document	Attachment A2 (Suggested)
Trade Study Results	Presentations and Documents	Attachment C
System Concept Risks	Status Presentation	Attachment A2 (Suggested)



Appendix N BAA – CLIN 002 Overview

CLIN 002 – HLS Sustaining Lunar Lander System Risk Reduction

- **Offerors can propose risk reduction efforts to be completed within ATP + 15 months**
 - Each risk reduction effort proposed must be clearly associated with an Offeror’s HLS Sustaining System Concept Risk
 - Proposed risk reduction effort must have task plan defined, which includes:
 - Scope, schedule and milestones; period of performance for each proposed risk reduction task will be no longer than 12 months
 - Task reporting approach (must have a minimum of one interim reporting milestone)
 - Anticipated results, deliverables to Government (e.g., documents, data)
 - Commercialized approach to achieve task plan
 - Task price
 - *Each risk reduction effort proposed will be itemized by task plan and price*
- **Offerors can propose Government Service support for a given risk reduction task**
 - Subject matter expertise (a.k.a. ‘Collaboration’)
 - NASA facility usage
 - NASA property usage
 - *Instructions on how to propose for Government Service support given in RFP*



Appendix N BAA – CLIN 004 Overview

CLIN 004 – HLS Sustaining Lander Concept Maturation and Final Review (8-month duration after end of CLIN 001)

- **Companies will continue to mature Lander concept(s) and report results**
 - Updates to their Initial Specification, Concept of Operations, and System Concept Risks presented at the Interim Review based on finding from any additional studies, trades, and CLIN 002 risk reduction activities completed.
 - Develop approaches for verification, validation, and certification activities based on the DRAFT HLS Sustaining requirements.
 - *If NASA chooses to exercise the CLIN 004 option, the duration of effort will be 8 months starting after the completion of CLIN 001.*

Deliverable	Deliverable Format	Document Content
Lander System Final Specification with Offeror Standards Approaches	Presentation and Final Document	Attachment A2
Verification, Validation, and Certification Approach	Presentation and Document	Attachment A2
Updated Concept of Operations, including Manufacturing and Operations	Presentation and Final Document	Attachment A2
Updated System Concept Risks	Presentation and Final Document	Attachment A2

Government engagement with CLIN 004 activities will be limited to joint working group support; no subject matter expertise, facility usage, or any other type of Government engagement will be allowed.



HLS Appendix N BAA: Mandatory Milestones*

Milestone	Solicitation Reference Section	Event Criteria / Deliverable	Completed Due Date (No Later Than)
CLIN 001: Contractor-led Kickoff Meeting	N/A	The Contractor will conduct a Kickoff Meeting at the start of the contract to discuss the study and risk reduction topics and the proposed plans for conducting the study and risk reduction.	ATP + 2 weeks
CLIN 001: Initial Version of Standards Feedback Delivered	Section 1.3.2.1	The Contractor will provide Initial version of Standards Feedback Delivered to NASA using Attachment A4.	ATP + 1 month
CLIN 001: Feedback on HLS Sustaining Requirements and Supporting Documents	Section 1.3.2.1	The Contractor will provide feedback on the HLS Sustaining Requirements and other supporting documentation per Section 1.3.2 instruction.	ATP + 6 weeks
CLIN 001: Concept and Mission Trade Studies Completed	Section 1.3.2.1	The Contractor will provide feedback on the HLS Sustaining Requirements and other supporting documentation per Section 1.3.2 instruction.	ATP + 6 weeks
CLIN 001: Sustaining Lander Interim Review and All CLIN 001 Products Complete	Section 1.3.2.1	The Contractor will conduct an Interim Review and deliver all final products for CLIN 001 scope of work.	ATP + 4 months
CLIN 004: Contractor-Led CLIN 004 Checkpoint	Section 1.3.2.2	The Contractor will conduct a checkpoint meeting reviewing CLIN 001 completed work and planned CLIN 004 work plan to meet the Final Review criteria.	ATP + 5 months
CLIN 004: Sustaining Lander Final Review and All CLIN 004 Products Complete	Section 1.3.2.2	The Contractor will conduct an Interim Review and deliver all final products for CLIN 004 scope of work.	ATP + 12 months
CLIN 002: All Risk Reduction Task Final Reporting and Data Transmittal Completed	Section 1.3.2.3	The Contractor will provide all funded CLIN 002 risk reduction task final reports and data.	ATP + 15 months

*Specific deliverable information detailed in Appendix N BAA RFP



Proposal Content Required [Page Limit]:

- Title Page [1]
- Executive Summary (Section I) [3]
- Proof of Eligibility (Section II) [3]
- Technical Proposal (Section III) [23]
 - Sustainable HLS Architecture Concept and Technical Approach
- Business Proposal (Section IV) [7]
 - Partnership model, corporate capabilities, intellectual property / data rights assertions
- Price Proposal (Section V) [No limit]
 - Itemized by CLIN 001, CLIN 002, and CLIN 004 tasks.
 - For CLIN 002 pricing, the Offeror shall provide itemized prices for each proposed risk reduction task.
 - » For CLIN 002 tasks awarded but not initially selected for funding, NASA will incorporate these tasks as options into the awarded contract for possible future funding.
 - CLIN 004 proposal will be evaluated as contract option, available for future funding per NASA's choice
 - Offerors shall provide existing rate agreements, if any.
 - Offeror shall include rates for any possible IDIQ tasks to be conducted within this Appendix.

Appendix N BAA – Proposal Content (Cont.)



Proposal Content Required [Page Limit]:

- Attachments (see section 4.2.7 Attachments to Proposals) [No limit]
 - Draft Statement-of-Work:
 - Work Breakdown structure and a description of the major tasks, activities and resources necessary
 - Proposed technical and payment milestones, including deliverables
 - Technical Performance Metrics and System Concept Risks
 - Quad chart summarizing the proposed objectives, team, and major milestones. Information provided by the Offeror in this chart must be publicly released upon contract selection and award.
 - Corporate Resources documentation: IF Offeror decides to propose corporate contributions, then verifiable evidence of the corporate contributions is required
 - Key Facilities and Equipment: Public and privately-owned facilities critical to proposed risk reduction efforts should be identified and described here.
 - Offeror exceptions to the provided model contract, including any clauses
 - Organizational Conflicts of Interest (OCI) Plan

Appendix N BAA – Government Service Request for CLIN 002 Proposal



- **Offerors may request access to Government facilities or Government services in their proposals for only CLIN 002 risk reduction task proposals**
 - NASA subject matter expertise ('Collaboration') will be made available through NASA in-kind contributions within a certain range.
 - Requested Government resources involving NASA facilities and / or services will be awarded through dispositioned Government Task Agreements (GTAs).
 - Optional Government furnished property requests will be awarded through dispositioned Optional Government Furnished Property Agreements (OGFPAs).
 - Requested Government-contributed resources should involve only those NASA facilities, services, or other in-kind contributions that are unique or not reasonably available commercially.
- **NASA Center capabilities and Points of Contact in Attachment G1 of this solicitation**
- **Government service requests proposed will be completed through provided quad chart (Attachment G3)**
 - NO GTA or OGFPA forms will be used during proposal phase; forms will be used for final GTA / OGFPA agreements after contract award
- **Estimated costs for Government service request proposed will be added to Total Evaluated Price of proposal**
 - GTA costs for proposed tasks (that are awarded) will be paid for through direct government funding
 - GTA costs for tasks requested during contract performance and outside of original awarded proposal will be funded through milestone payment adjustments



Appendix N BAA Proposal Eligibility, Evaluation Criteria and Ratings

- **Proposal Eligibility:**

- All proposals must include CLIN 001 and CLIN 004 to be eligible for evaluation.
- Other proposal eligibility requirements described within solicitation.

- **4 Evaluation Factors:**

- **Factor 1 – Relevance:** The Government will evaluate the relevance of the proposal to meet the overall objectives of the Sustainable HLS.
- **Factor 2 – Technical Approach:** The Government will evaluate the quality, depth, and thoroughness of the proposed Technical Approach as well as the identification and mitigation of key risks and logical organization and progression of work tasks.
- **Factor 3 – Management:** The Government will evaluate the overall quality of the team, including the organization’s past performance on similar efforts, its capabilities and resources.
- **Factor 4 – Price:** *Information on following chart*

- **Usage of Adjectival Ratings**

- Each Factor’s specific areas of evaluation will be considered in totality to arrive at a single adjectival rating each for Factors 1,2, and 3. The Offeror’s Price proposal will not receive an adjectival rating.
- For evaluation of Factors 1, 2, and 3, the Government will identify strengths and weaknesses for each Factor’s specific areas of evaluation. (Specific areas of evaluation listed in RFP)

- **Evaluation Factor Relative Weighting**

- Technical Approach factor is more important than the Relevance factor, which is more important than the Management factor. When combined, Factors 1, 2, and 3 are significantly more important than Factor 4, Price.

Factors 1,2, and 3 Adjectival Ratings
Outstanding
Very Good
Acceptable
Marginal
Unacceptable



Appendix N BAA Proposal Evaluation Criteria - Price

- **4 Evaluation Factors:**
 - **Factor 1 – Relevance**
 - **Factor 2 – Technical Approach**
 - **Factor 3 – Management**
 - **Factor 4 – Price:** The Government will calculate a Total Evaluated Price that it will use for evaluation of Factor 4 – Price.
 - The Total Evaluated Price shall be inclusive of the Offeror's proposed amounts for CLINs 001, 002, 004, plus the value of any Optional GFE/GFP, plus the value associated with any GTAs.
 - When an Offeror, as part of its proposal, proposes to use one or more items of Optional GFE/GFP, the Total Evaluated Price will be adjusted by applying, for evaluation purposes only, the value of such Government property as specified by NASA.
 - When an Offeror, as part of its proposal, proposes to perform a portion of the work on-site at one or more NASA facilities using NASA resources to do so (as documented in the provided Attachment G3 form(s)), the Government will adjust the Total Evaluated Price by applying, for evaluation purposes only, the value of all such Government requests.
 - The Government will evaluate the overall price reasonableness of the total firm fixed-price estimate, including any Corporate Contributions and the extent to which the Offeror complied with the specified dollar limits in this Appendix. The Government will use price analysis techniques as identified in FAR 15.404-1(b) for this evaluation.

Appendix N BAA Awards, Funding, and Period of Performance



- **Initial Award(s):**
 - Receiving an CLIN 001 award is required to receiving CLIN 002, CLIN 003, and / or CLIN 004 awards
- **Funding:**
 - Total evaluated price of CLIN 001 + initially funded CLIN 002 risk reduction tasks shall not exceed \$45M per award.
 - Assuming favorable evaluation of CLIN 002 and CLIN 004 proposal content:
 - CLIN 002 risk reduction tasks initially unfunded will be incorporated into the contract as options, to be exercised at NASA's choice within the Appendix N period of performance (15 months)
 - CLIN 004 task will be incorporated into the contract as option, to be exercised at NASA's choice starting at ATP+4 month after CLIN 001 completion
 - Total evaluated price of CLIN 001 + CLIN 004 + all exercised CLIN 002 risk reduction tasks shall not exceed \$100M.
- **Period of Performance:**
 - All CLIN 001 activities shall not exceed ATP + 4 months.
 - All CLIN 002 activities shall not exceed ATP + 15 months.
 - All CLIN 004 activities shall not exceed 8 months from completion of CLIN 001(ATP + 12 months)
 - All CLIN 003 activities shall not exceed ATP + 36 months.

Comments and questions shall be submitted electronically to HQ-NextSTEP-BAA@mail.nasa.gov, Attn: Jennifer McCaghren, no later than 5:00 p.m. Central Time on July 9, 2021.

Resources

- NASA Capabilities: https://beta.sam.gov/api/prod/opps/v3/opportunities/resources/files/bd0a2a14be97a31860c6523fe8089776/download?api_key=null&status=archived&token=
- NextSTEP Appendix N: <https://www.nasa.gov/nextstep/humanlander3>
- NextSTEP Appendix E: <https://www.nasa.gov/nextstep/humanlander>
- NextSTEP Appendix H: <https://www.nasa.gov/nextstep/humanlander2>
- More about HLS: <https://www.nasa.gov/content/humans-on-the-moon-0>

